DOCUMENT RESUME

ED 257 863 TM 850 330

AUTHOR Brooks, Jennifer Giddings; Tees, Sandra
TITLE Study of the Instructional Effectiveness of Last Period Middle School Classes.
INSTITUTION Fort Worth Independent School District. Tex. Dept. of Research and Evaluation.
PUB DATE Mar 85
NOTE 20p.; Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985). Best copy available.
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; *Class Organization; *Classroom Environment; English Instruction; High Schools; Intermediate Grades; Mathematics Instruction; Middle Schools; Performance Factors; Physical Activity Level; *School Schedules; School Surveys; Secondary Education; Student Behavior; *Time Factors (Learning); Time on Task
IDENTIFIERS *Fort Worth Independent School District TX

ABSTRACT

To facilitate cost effective bus schedules, middle school classes begin one hour later than high school classes in the Fort Worth Independent School District, Texas. This study investigated whether middle school students were adversely affected, in terms of grades and classroom performance, by having the class day extended to 4 p.m. High schools were included in the study to determine the effect of time of day on last period students. Grades were collected from sets (a morning class and a comparable afternoon class taught by the same teacher) of fall, 1983, English or math classes. Classroom observations were made in the spring. Findings indicated that: (1) grades were not significantly higher in morning classes. Middle School student grades were higher in last period classes; (2) time on task was not significantly higher in the morning; (3) noise and activity levels were higher in last period classes, but this only affected student performance when teacher management skills were weak; and (4) the later start time caused individual student problems and scheduling difficulties for school personnel. Since middle school student achievement was not affected by the later time for last period classes, no schedule changes were recommended except for scheduling extra-curricular activities during before school hours when feasible. Appended are teacher and staff comments and a table showing distribution of student grades for Fall, 1983, by subject, level, and teacher for first and last period classes. (BS)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

FORT WORTH INDEPENDENT SCHOOL DISTRICT

ED257863

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

STUDY OF THE INSTRUCTIONAL EFFECTIVENESS OF LAST PERIOD MIDDLE SCHOOL CLASSES

Paper Presented to the
American Educational Research Association
Chicago, Illinois
March, 1985

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
J. Brooks
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Jennifer Giddings Brooks
Sandra Tees
Evaluators, Research and Evaluation Department

Dan Powell, Director
Department of Planning, Research and Evaluation

Fort Worth Independent School District
3210 West Lancaster
Fort Worth, Texas 76107

TM 850 330

BOARD OF EDUCATION

DR. H. RICHARD O'NEAL . . . . . PRESIDENT

MRS. MOLLIE LASATER. . . . . VICE PRESIDENT

MR. T. A. SIMS. . . . . SECRETARY

MR. BILL ELLIOTT

MRS. SUZANNE LASKO

MRS. MAUDRIE M. WALTON

MR. LOFTIN WITCHER

MRS. JOCELYN WOESTER

ADMINISTRATIVE STAFF

Dr. I. Carl Candoli. . . . . Superintendent of Schools

Mr. Eugene J. Gutierrez. . . . . Associate Superintendent for Non-Instructional Services

Dr. Lonnie Wagstaff. . . . . Associate Superintendent for Instructional Services

Dr. James M. Bailey. . . . . Assistant Superintendent for Non-Instructional Services

Mrs. Frances Chaney. . . . . Assistant Superintendent for Instructional Planning and Development

Dr. Robert McAbee. . . . . Assistant Superintendent for Secondary Education

Mr. Joe Ross . . . . . Assistant Superintendent for Community Employee, & Governmental Relations

Mr. J. D. Shipp. . . . . Assistant Superintendent for Elementary Education

Dr. T. C. Wallace. . . . . Assistant Superintendent for Personnel

DEPARTMENT OF RESEARCH AND EVALUATION

Dr. Dan Powell, Director
Fae Lysiak, Assistant Director
Dr. Whitcomb G. Johnstone, Coordinator of Testing
Sherry Wallace, Evaluator
Sandra Tees, Evaluator
Jennifer Giddings Brooks, Evaluator
Dr. Sharon Hardeman, Evaluator
Linda Monaco, Evaluator
Barry Rutherford, Evaluator
Rita Sierra, Evaluator
Dr. Helen Abadzi, Data Analyst

EXECUTIVE SUMMARY

A STUDY OF THE INSTRUCTIONAL EFFECTIVENESS OF LAST PERIOD MIDDLE SCHOOL CLASSES

PURPOSE: Middle school classes begin one hour later than high school classes to facilitate cost effective bus schedules. Community and school personnel have asked if extending the class day to 4 p.m. adversely affects student achievement.

DESCRIPTION: Research questions focused on grades and student classroom performance. High schools were included in the study to determine the effect of time of day on last period students. Grades were collected from sets of Fall, 1983, English or math classes. A "set" was a morning class and an afternoon class taught by the same teacher and comparable with respect to subject, level and caliber of students. Classroom observations were done in similar sets of 1984, Spring, classes.

RESEARCH FINDINGS: 1) Grades were not significantly higher in morning classes. For middle school students, grades were higher in last period classes. 2) Classroom performance (time on task) was not significantly higher in morning classes. 3) Noise/activity levels are higher in last period classes; this affected student performance only when teacher management skills appeared weak. 4) The later start time causes individual student problems and scheduling difficulties for school personnel.

CONCLUSIONS: Middle school student achievement is not affected by the later hour of the last period class. Teachers with weak management skills have greater difficulty with last period classes, regardless of time of day.

RECCOMENDATIONS: 1) Since the current system presents no major detriment to student achievement, no changes are recommended in the current middle school scheduling. 2) Consider scheduling extra-curricular activities in before school hours when feasible. 3) Allow for individual student schedule changes to accommodate special problems. 4) Provide greater support for teachers with poor management skills.

Jennifer Giddings Brooks
Sandra Tees
Research and Evaluation

BEST COPY

A STUDY OF THE INSTRUCTIONAL EFFECTIVENESS OF LAST PERIOD MIDDLE SCHOOL CLASSES

WHAT HAPPENS TO MIDDLE SCHOOL STUDENTS IN CLASSES THAT RUN FROM 3 TO 4 P.M.?

To facilitate cost effective transportation schedules, middle school students now have their last period classes from 3 to 4 p.m. High school students begin classes at 8 a.m. and end at 3 p.m., an hour earlier than students in middle school.

Community and school personnel have questioned the advisability of the later scheduling for middle school. The question asked:

> Is pupil achievement adversely affected by extending the class day to 4 p.m.?

WHAT RESEARCH QUESTIONS WERE ASKED?

Three major research questions were formulated to address this issue:

1) Are student grades affected by the position of a class period (a morning class versus a last period)?
2) Is student classroom performance/behavior affected by the time of a class period?
3) If last period classes show poor performance and low grades, is the relevant factor the time (3 to 4 p.m.) or the position (last) of the class in the overall schedule?

WHAT POPULATIONS AND SUBJECT AREAS WERE STUDIED?

Schools. Secondary schools from four pyramids were chosen for the study:

#160	Forest Oak Middle	(Southeast area)
#270	O. D. Wyatt High	
#157	J. P. Elder Middle	(North)
#262	Northside High	

(continued)

BEST COPY

#162	Wedgwood Middle	(South)
#260	Southwest High	
#167	O. B. Leonard Middle	(West)
#268	Western Hills High	

Since last period high school classes are held one hour earlier than those in middle schools, high schools were included in the study to address the third research question (i.e., whether time of a class or position of class is the relevant factor).

Subject area. Math and English classes were chosen as target subject areas.

HOW WERE GRADES COLLECTED/OBSERVATIONS MADE?

Grades. Semester grades were collected for sets of Fall, 1983, English or math classes. The collection plan is shown in Table 1. A set consisted of students in a morning (first or second period) class and a last period class. In each set the two (early and last period) classes were taught by the same teacher, and were comparable with respect to subject, level, and caliber of students. A total of 455 middle school and 559 high school grades were collected (16 classes at each level).

Observations. During the Spring of 1984 two evaluators observed math or English classes in the eight schools (see Table 1). Again, each set of classes consisted of one morning and one last period class taught by the same teacher and comparable with respect to subject, level, and caliber of students. A total of 14 middle school and 14 high school classes were observed.

In addition, four fifth period classes were observed and grades collected. This was done primarily to determine whether or not the study should be extended further in this direction (in answer to research question #3). Gross differences were not found; no additional fifth period classes were included in the study.

Teacher input. Whenever possible teachers were asked about differences in their first and last period classes. Their responses are shown in Appendix A.

BEST COPY

WERE GRADES SIGNIFICANTLY HIGHER IN MORNING CLASSES?

No. In answer to the first research question, statistical analyses indicate that grades are not affected by position of a class period. Analysis of variance yielded no statistically significant differences between grades in morning versus last period classes. Regression results indicate that less than a tenth of one percent of the variation in grades is accounted for by the class period factor (see Tables 2-4).

In response to the third research question, it appears that neither class period position nor time of the last period affects grades. While overall diferences were not statistically significant, middle school last period grades were somewhat higher than grades of middle school morning classes and were considerably higher than those of last period high school students. It is not clear why high school last period grades were lower. Further study would be needed to determine what variables might affect last period high school grades. Average grades and distribution of grades are presented in Appendix B.

WAS MIDDLE SCHOOL STUDENT TIME ON TASK SIGNIFICANTLY HIGHER IN MORNING CLASSES?

No. In answer to the second research question, an average of 82.1% of middle school students were on task during morning classes, with an average of 82.0% on task in last period classes. A slightly lower percentage of high school students were on task: 79.6% in morning classes, 75.7% in last period classes. Nonparametic analysis of these data show no statistically significant differences in time on task, morning versus last period (see Tables 5,6).

WHAT DID TEACHERS SAY?

A majority of interviewed teachers favored morning classes for several reasons. They felt that students work better in the mornings and are more active in afternoon classes. Several indicated that middle school students would benefit from coming to school at earlier times for a variety of reasons, e.g., eliminating the problem of loitering early arrivers, late hours for extracurricular activities, and students who perform poorly in late day.

Only three teachers felt that grades were lower in last period classes; two of these were high school teachers. There were several teachers, however, and one administrator who noted that students are

BEST COPY

not always at their best, often lethargic or lesent, during first periods. (See Appendix A for teacher comments.)

Overall reactions of school personnel tend to indicate that:

1) afternoon classes, rather than last period per se, may be more difficult from a management standpoint, and

2) the later time for last period classes in middle school presents scheduling problems, not student achievement problems.

WHAT WERE THE IMPRESSIONS OF THE CLASSROOM OBSERVERS/EVALUATORS?

Each evaluator observed both the morning and last period of each teacher/class set. In addition to calculating time on task, these evaluators compared morning and last periods with respect to overall quality and tone of the classes. Three major conclusions came from these observations:

1) teachers who had well disciplined classes in the morning also had well managed last period classes;

2) teachers with poorly disciplined classes in the morning had even greater problems with last period classes, and

3) noise/activity levels were higher in last period classes, but time on task and general quality of the class seemed affected only when discipline problems were apparent in morning classes.

CONCLUSIONS: WHAT ARE THE PROS/CONS OF CONTINUING THE LATER LAST PERIOD CLASSES IN MIDDLE SCHOOLS?

PRO: 1) Neither student achievement nor student classroom performance are materially affected by the later last period class.

2) Present middle school scheduling facilitates cost effective transportation schedules; funds saved as a result can be redirected into academic programs.

CON: 1) The later scheduling is inconvenient for some school personnel.

2) Afternoon classes are a greater strain for teachers with weak management skills.

BEST COPY

RECOMMENDATIONS

1) Since the current system presents no major detriment to student achievement, no changes are recommended in the present middle school scheduling.

2) Consider scheduling extracurricular activities in the early morning before school hours when possible;

3) Allow changes in classes for students who appear to have special problems with late afternoon classes (schedule their basic courses for the morning), and

4) Provide greater support for teachers with poor management skills, with emphasis on developing an awareness of special problems in afternoon classes.

BEST COPY

Table 1. Data collection/class observation plan.

School	Fall 1983 Grades	# of Classes	Spring 1984 Classes to Observe	# of Classes
Forest Oak	Math	4	English	4
C. D. Wyatt	English	4	Math	4
Elder	English	4	Math	4
Northside	Math	4	English	4
Wedgwood	Math	4	English	4
Southwest	English	4	Math	4
Leonard	English	4	Math	2
Western Hills	Math	4	English	2

BEST COPY

Table 2. Comparison summary: average grades broken down by period, by school level, and total sample. Note: A=4.0; B=3.0; C=2.0; D=1.0.

Period	Average Grade	N
Morning	1.71	480
Middle School	1.71	230
High School	1.72	250
Last Period	1.78	472
Middle School	1.92	225
High School	1.66	247

School Level	Average Grade	N
Middle School	1.82	455
Morning	1.71	230
Last Period	1.92	225
High School	1.69	497
Morning	1.72	250
Last Period	1.66	247

Total Sample	1.75	952

BEST COPY

Table 3. Analysis of variance summary table. Grade average by period, by school level. Total N = 952.

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	5.000	2	2.500	1.644	.194
Period	1.154	1	1.154	.759	.384
School Level	3.857	1	3.857	2.537	.112
2-Way Interactions	4.651	1	4.651	3.057	.081
Period/School Level	4.651	1	4.651	3.059	.081
Explained	9.652	3	3.217	2.116	.097
Residual	1441.344	948	1.520		
Total	1450.995	951	1.526		

Table 4. Results of stepwise multiple regression analysis: regression of grade average on period, school level, teacher, subject area.

Variable	R (amount of variance accounted for)
1. Teacher	.00253
2. School level	.00345
3. Period	.00392
4. Subject area	.00399

BEST COPY

Table 5. Classroom observations: percent of students on task during entire class period.

School #	Subject	Period 1 or 2	Last Period
157	Math	90	90
	Math	68	65
160	English	59	81
	English	90	90
162	English	90	87
	English	88	82
167	Math	90	79
	Average percent Middle School Students:	82.1	82.0
260	Math	88	85
	Math	90	90
262	English	77	67
	English	95	85
268	English	68	74
270	Math	89	95
	Math	50	74
	Average percent High School Students:	79.5	75.7
Average percent students on task:		80.9	78.9

BEST COPY

Table 6. Results of sign test analysis of classroom observation data.

	Percent of Student Time on Task		
	First, Second Period	Last Period	Sign of Difference
MIDDLE SCHOOL	90	90	0
	68	63	-
	59	81	+
	90	90	0
	90	67	-
	88	82	-
	70	79	-
		n = 5 x = 1	p = .188
HIGH SCHOOL	88	85	-
	90	90	0
	77	67	-
	95	85	-
	66	74	+
	89	55	-
	50	74	+
		n = 6 x = 2	p = .344
	Combined:	n = 11 x = 3	p = .113

BEST COPY

APPENDICES

Appendix A. Teacher/Staff Comments.

Comments

O. D. Wyatt High School

1. Vice Principal
   - Students tend to perform better later in the day rather than during first period.
   - Students are not considered tardy until 8:20 A.M. (Classes begin at 8 a.m.). In some first period classes only 10 students* are present prior to 8:20.
     *Buses are late occasionally.
     There can be other first period interruptions.
   - Mornings are good for slow learners, they are not necessarily good for average and above average students.

2. Math Teacher
   - Morning: Students are calm and ready to work.
     Attitudes are better.
   - After Lunch: Students are edgy - don't want to work.
   - Most Honor Courses are in the mornings.

3. Math Teacher
   - Higher absenteeism in the afternoon.
   - The computer was down this year during registration. Because of this, students had to register themselves. Those students' that took math on the last period are least interested in the subject.
   - First period is always a good period whether it is a honors class or a fundamental class.

Forest Oak Middle School

1. English Teacher
   - Students are lethargic during first period.
   - During last period some students tend to be hyperactive (might have to do with having sugar for lunch).
   - It would be better for students if classes started at 8 instead of 9. This would help students to wake up sooner.
   - The way the middle school schedule is now, means that some students are in the building until 4:30 P.M.

Wedgwood Middle School

1. Principal
   - Because students are on parents' schedule, many of them get to school an hour/an hour and a half before school starts. Students are tired by the time they go to first period at 9 A.M.
   - The 4 P.M. dismissal time, makes after-school activities start too late.

2. English Teacher
   - First period class is subdued.
   - Last period class is in a hurry to complete work and go home.
   - Last periods are usually more active/talkative than first periods.

BEST COPY

3. English Teacher
   - It would help the students if school started at 8:30 A.M.
   - The last period class socializes more than the first period class.

Southwest High School
1. Math Teacher
   - More social interaction last period class.
   - Higher grades in first period class.

2. Math Teacher
   - Last period class is very active.
   - Last period class is a talkative class.

Northside High School
1. English Teacher
   - Basically the sixth period is a little less firm - not as rigid.
   - First period classes tend to have less behavioral problems than the sixth period classes.
   - The grades in my classes are better at first period.

2. English/Journalism Teacher
   - We should remember that some people are slow starters. Mornings are not good.
   - Classes with involved activities should be held in the afternoons.
   - Might consider letting students arrange their schedules according to whether they are "morning" people or "afternoon" people.
   - At McLean, during the 60s, the principal tried a weekly rotating schedule. Example: The first period would become the sixth period-the sixth becomes the first etc.... This type of scheduling proved to be very effective.

Elder Middle School
1. Principal
   - Students are at school early, it would be beneficial if they could start classes at that time.
   - In the fall it is dark when after school activities are completed.

2. Math Teacher
   - Although somedays students are tired in the afternoons, I don't have any problems with them because of my discipline policy.
   - I tend to have more failing grades in the afternoon classes, but that might have to do with the caliber of students.
   - The 9 A.M. starting time is too late for middle school students. Students come to school before 9 A.M., so it would be nice if they could start classes.

3. Math Teacher
   - On most days classes are about the same.
   - Some afternoons students seem to be more hyper than on other afternoons.
   - Fifty-five minute class periods are too long for middle school students. Forty to forty-five minute periods are long enough.
   - I have problems getting the attention of all of my students - especially this time of year.

BEST COPY

4. English Teacher
   - 9 A.M. is too late to start school with these children.
   - A majority of the neighborhood students are at school around 8 A.M. The only students to show up at 9 A.M. are those on the bus.
   - I tell my afternoon class that they sometimes don't get me at my best, because of the time of day.
   - Most of the students in my last period class are tired and/or restless.

Leonard Middle School

1. Math Teacher
   - Students are more active in the afternoon, but classses are still pretty much the same. I don't have more trouble with one than with another.

Western Hills High School

1. English Teacher
   - It is harder to keep their attention in the afternoon, but sometimes it's hard to get them awake for first period.

BEST COPY

Appendix B.

Table 1B. Distribution of student grades for fall semester, 1983, by subject, school level, and teacher for first and last period classes.

MIDDLE SCHOOL MATH	PERIOD 1 OR 2						LAST PERIOD					
Teacher #	A	B	C	D	F	N	A	B	C	D	F	N
2	3.8	15.4	34.6	19.2	26.9	26	0	22.2	40.7	14.8	22.2	27
9	3.8	19.2	23.1	7.7	46.2	26	14.8	14.8	14.8	14.8	40.7	27
13	10.0	13.3	30.0	6.7	40.0	30	3.7	14.8	40.7	14.8	25.9	27
14	35.5	22.6	3.2	29.0	9.7	31	41.4	17.2	10.3	20.7	10.3	29
Average:	14.2	17.7	22.1	15.9	30.1	113	15.5	17.3	26.4	16.4	24.5	110
ENGLISH												
8	11.5	30.8	23.1	34.6	0	26	4.2	54.2	16.7	25.0	0	24
12	0	9.7	25.8	54.8	9.7	31	0	3.3	23.3	70.0	3.3	30
16	3.0	9.1	6.1	36.4	45.5	33	6.7	10.0	23.3	23.3	36.7	30
18	25.9	33.3	29.6	7.4	3.7	27	48.4	32.3	12.9	3.2	3.2	31
Average:	10.2	20.5	21.3	33.2	14.7	117	14.9	24.6	19.1	30.6	10.7	115

HIGH SCHOOL MATH	PERIOD 1 OR 2						LAST PERIOD					
Teacher #	A	B	C	D	F	N	A	B	C	D	F	N
5	20.6	29.4	20.6	20.6	8.8	34	0	14.3	3.4	34.3	20.0	23
6	3.1	21.9	34.4	25.0	15.6	32	15.4	7.7	26.9	23.1	26.9	26
7	20.0	13.3	20.0	33.3	13.3	30	3.7	25.9	14.8	33.3	22.2	27
15	5.9	2.9	32.4	35.3	23.5	34	2.6	36.8	31.6	18.4	10.5	38
Average:	12.3	16.9	26.9	28.5	5.4	130	4.8	22.2	27.0	27.0	19.0	126
ENGLISH												
3	0	9.7	45.2	29.0	16.1	31	2.9	31.4	38.2	8.8	17.6	34
4	2.9	14.7	23.5	44.1	14.7	34	3.1	18.8	37.5	28.1	12.5	32
10	4.3	30.4	17.4	21.7	26.1	23	0	10.5	31.6	36.8	21.1	19
11	6.3	28.1	34.4	6.3	25.0	32	0	8.3	47.2	27.8	16.7	36
Average:	3.3	20.6	30.8	25.8	20.0	121	1.7	16.8	40.3	24.4	16.8	119

BEST COPY

Table 2B. Average grades by teacher by period.

TEACHER CODE	AVERAGE PERIOD ONE OR TWO*	AVERAGE LAST PERIOD*	AVERAGE BOTH PERIODS*	N
(MIDDLE SCHOOL)				
2	1.5	1.6	1.57	57
8	2.2	2.4	2.28	50
9	1.3	1.5	1.38	53
12	1.4	1.3	1.31	61
13	1.5	1.6	1.51	57
14	2.5	2.6	2.52	60
16	.9	1.3	1.06	63
18	2.7	3.[illegible]	2.97	58
(HIGH SCHOOL)				
3	1.5	1.9	1.72	65
4	1.5	1.7	1.59	66
5	2.3	1.4	1.86	69
6	1.7	1.6	1.7	58
7	1.[illegible]	1.6	1.8	57
10	1.7	1.3	1.5	42
11	1.8	1.5	1.7	58
15	1.3	2.0	1.7	72
	(FIFTH PERIOD)			
1	2.2	1.5	1.8	65
17	1.6	1.4	1.5	58

BEST COPY